Saskatchewan-North Dakota Trans-Boundary Ambient Monitoring Network

Air Quality Report

4th Quarter 2003

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Introduction

The Saskatchewan (SK) - North Dakota (ND) Trans-Boundary Ambient Monitoring Network is a cooperative effort among Environment Canada (EC), US Environmental Protection Agency (EPA), Saskatchewan Environment (SE), North Dakota Department of Health (NDDH), and SaskPower. The working participants are SaskPower (Boundary Dam Power Station) and NDDH (Division of Air Quality). After the initial data sharing details are worked out, data collected by SaskPower at the Boundary Dam Power Station (BDPS) and Estevan site continuous data will be included in this quarterly report.

Section One provides a description of the data collected, by pollutant, and a brief summary of data and any significant action(s) that may affect the data. Section Two presents the data in summary tables comparing the data to the applicable Saskatchewan, North Dakota and US ambient air quality standards. Section Three lists any exceedance of the North Dakota ambient air quality standards first by site and date, then by date and site.

SECTION ONE

DISCUSSION OF

MONITORING RESULTS

Sulfur Dioxide (SO_2)

There were no exceedances of either the Saskatchewan, ND state, or US federal standards during the quarter. The maximum 1-hour concentration was 75 ppb on October 5 at Short Creek, ND; the maximum 3-hour concentration was 38 ppb on December 22 at Short Creek, ND; and, the maximum 24-hour concentration was 15 ppb on December 22 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

Sulfur Dioxide (SO_2) 5-Minute Average

The maximum 5-minute concentration was 123 ppb on October 5 at Short Creek, ND.

Nitrogen Dioxide (NO_2)

The maximum 1-hour concentration observed was 30 ppb on October 5 at Short Creek, ND. An 80% data recovery was not achieved for the period operated.

Short Creek failed to achieve 80% data recovery due to a machine malfunction.

Inhalable Continuous $PM_{2.5}$ Particulates

The maximum 1-hour concentration was 24.3 $\mu g/m^3$ on October 4 at Short Creek, ND.; the maximum 24-hour concentration was 8.2 $\mu g/m^3$ on October 3 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

Inhalable FRM $PM_{2.5}$ Particulates

The maximum 24-hour average concentration was 22.8 $\mu g/m^3$ on October 6 at Estevan, SK An 80% data recovery was achieved at all sites the period operated.

Inhalable PM_{10} Particulates

There was no exceedance of the 24-hour Saskatchewan or ND state standards during the quarter. The maximum 24-hour average concentration was 25 $\mu g/m^3$ on October 6 at Short Creek, ND. An 80% data recovery was not achieved for the period operated.

Short Creek failed to achieve 80% data recovery due to equipment malfunctions.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MAXIMA 1 - HOUR 1ST MM/DD:HH	1 - HOUR 2ND MM/DD:HH	3 - HOUR 1ST MM/DD:HH	3 - HOUR 2ND MM/DD:HH	24 - HOUR 1ST MM/DD	24 - HOUR 2ND MM/DD	ARITH MEAN	1HR #>273	24HR #>99	% >MDV
Short Creek, ND	2003	OCT-DEC	2194	75 10/05:17	58 12/22:05	38 12/22:05	38 12/22:08	15 12/22	9 10/05	2.4			28.7

The maximum 1-hour concentration is 75 ppb at Short Creek, ND on 10/05:17
The maximum 3-hour concentration is 38 ppb at Short Creek, ND on 12/22:05
the maximum 24-hour concentration is 15 ppb at Short Creek, ND on 12/22

* The air quality standards are:

Sask. Provincial Standards -
1) 0.17 ppm maximum 1-hour average concentration.
2) 0.06 ppm maximum 24-hour average concentration.
3) 0.01 ppm annual arithmetic mean.

ND STATE Standards -
1) 273 ppb maximum 1-hour average concentration.
2) 99 ppb maximum 24-hour average concentration.
3) 23 ppb maximum annual arithmetic mean concentration.

US FEDERAL Standards -
1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	5-MINUTE MAXIMA 1ST	DATE MM/DD:HH	2ND	DATE MM/DD:HH	3RD	DATE MM/DD:HH	# HOURS >600	% >MDV
Short Creek, ND	2003	OCT-DEC	2148	123	10/08:09	117	10/03:09	95	10/05:17	0	41.2

The maximum 5-minute concentration is 123 ppb at Short Creek, ND on 10/08:09

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MAXIMA 1-HOUR 1ST MM/DD:HH	MAXIMA 1-HOUR 2ND MM/DD:HH	ARITH MEAN	% >MDV
Short Creek, ND	2003	OCT-DEC	1523 ***	30 10/05:17	30 12/22:05	3.2	80.0

The maximum 1-hour concentration is 30 ppb at Short Creek, ND on 10/05:17

* The air quality standards are:

Sask. Provincial Standards are:
1) 0.2 ppm maximum 1-hour average concentration.
2) 0.05 ppm maximum annual arithmetic mean concentration.

ND STATE - 53 ppb maximum annual arithmetic mean.

US FEDERAL - 53 ppb annual arithmetic mean.

*** Less than 80% of the possible samples (data) were collected.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous $PM_{2.5}$ ($\mu g/m^3$)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MAX 1-HOUR 1ST MM/DD:HH	MAX 1-HOUR 2ND MM/DD:HH	MAX 24-HOUR 1ST MM/DD	MAX 24-HOUR 2ND MM/DD	MAX 24-HOUR 3RD MM/DD	MAX 24-HOUR 4TH MM/DD	MEAN	1HR #>150	24HR #>65
Short Creek, ND	2003	OCT-DEC	1864	24.3 10/04:21	18.0 10/09:23	8.2 10/03	6.6 10/05	6.6 10/08	6.5 10/20	2.7		

The maximum 1-hour concentration is 24.3 $\mu g/m^3$ at Short Creek, ND on 10/04:21
The highest 24-hour concentration is 8.2 $\mu g/m^3$ at Short Creek, ND on 10/03

* The ambient air quality standards are:
US FEDERAL Standards -
1) 24-hour: 3-year average of 98th percentiles not to exceed 65 $\mu g/m^3$.
2) Annual: 3-year average not to exceed 15 $\mu g/m^3$.

Canadian-Wide Standard -
24-hour: 3-year average of 98th percentiles not to exceed 30 $\mu g/m^3$.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable FRM $PM_{2.5}$ Particulates ($\mu g/m^3$)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	MAXIMA 1ST MM/DD	MAXIMA 2ND MM/DD	MAXIMA 3RD MM/DD	ARITH MEAN	#>150	AM>50	% >MDV
Estevan, SK	2003	OCT-DEC	14	2.7	22.8 10/06	11.0 11/23	10.3 10/18	7.9			100.0
Lignite, ND	2003	OCT-DEC	14	2.4	9.1 10/06	9.0 11/11	8.7 12/11	5.5			100.0
Raferty Dam, SK	2003	OCT-DEC	15	3.5	19.7 10/06	14.0 11/17	9.2 12/05	8.0			100.0
Short Creek, ND	2003	OCT-DEC	14	2.8	10.8 10/06	9.7 11/11	9.7 12/11	6.3			100.0

The maximum 24-hour concentration is 22.8 $\mu g/m^3$ at Estevan, SK on 10/06

* The ambient air quality standards are:
US FEDERAL Standards -
1) 24-hour: 3-year average of 98th percentiles not to exceed 65 $\mu g/m^3$.
2) Annual: 3-year average not to exceed 15 $\mu g/m^3$.

Canadian-Wide Standard -
24-hour: 3-year average of 98th percentiles not to exceed 30 $\mu g/m^3$.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM_{10} Particulates ($\mu g/m^3$)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	MAXIMA 1ST MM/DD	MAXIMA 2ND MM/DD	MAXIMA 3RD MM/DD	ARITH MEAN	#>150	AM>50	% >MDV
Short Creek, ND	2003	OCT-DEC	10 ***	1.0	25.0 10/06	14.0 10/18	11.0 10/24	9.7			80.0

The maximum 24-hour concentration is 25.0 $\mu g/m^3$ at Short Creek, ND on 10/06

* The STATE and FEDERAL air quality standards are:
1) 150 $\mu g/m^3$ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
2) 50 $\mu g/m^3$ expected annual arithmetic mean.

*** Less than 80% of the possible samples (data) were collected.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and $PM_{2.5}$ and PM_{10} ($\mu g/m^3$)

The * Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and $PM_{2.5}$ and PM_{10} ($\mu g/m^3$)

The * Identifies the Exceedances

NONE